REMARKS

Claims 1-2 and 4-26 are pending, claims 12-20 having been withdrawn. By this Response, claims 1 and 8 are amended, claim 3 is cancelled and claims 21-26 are added. Reconsideration and allowance based on the above-amendments and following remarks are respectfully requested.

The Office Action rejects claims 1-11 under 35 U.S.C. §103(a) as being unpatentable over Suzuki (U.S. Patent No. 5,987,185) in view of Le (U.S. Patent No. 6,608,942). This rejection is respectfully traversed.

Suzuki teaches a filtering device which filters particular segments of an image in order to eliminate noise. The noise refers to dots or as Suzuki defines them "parched sesame seeds mixed with salt" which appear in the adjacent area of an image. See Fig. 13. In accomplishing the above, Suzuki teaches using a characteristic extraction means to compare an extracted characteristic value with a predetermined threshold value in order to generate signals indicating whether or not to filter the original image data. In a first embodiment, a difference between adjacent pixel values, and filtering is performed or not performed according to whether the absolute value is less than the predetermined threshold or not less than the threshold. In other words, areas with small density changes are filtered and areas with large density changes are not filtered. In Fig. 8, the upward spike around position

16 and the downward spike around position 46 are left unfiltered. See column 2, lines 45-67 and column 7, lines 5-10.

As disclosed on pages 1-5 of the specification, the present invention addresses the problem that, since bright objects tend to appear larger than dark objects, when fine dark patterns such as text in a small font are displayed, if the dark patterns are filtered to smooth out jagged edges, they may become too faint to see easily. The solution offered by the present invention is to filter bright parts of an image that are adjacent to dark parts, thereby smoothing out jagged edges, but to leave the dark parts unfiltered, so that they do not become faint.

In contrast, Suzuki is concerned with filtering out image noise without degrading the sharpness of contours, such as edges, in the image. Suzuki fails to address any concerns regarding larger sizes of bright objects or make any special allowance for the tendency of fine dark patterns to become too faint to be seen. Further, the system of Suzuki is designed to remove or "eliminate" certain dark areas located adjacent to the main image which are detected to be noise. This removal, although providing a sharper image by eliminating distractions of the eye, does not filter the main image and in fact does not even perform a smoothing operation as it is designed to "eliminate" noise.

In the present invention as currently recited in claims 1 and 8, the criteria for leaving an area unfiltered is not whether there are large density changes in the area, but whether the area is a bright area adjacent to a dark

area. In contrast, Suzuki, for example, in Fig. 7 teaches filtering both areas 55 and 56 (see column 6, lines 42-47), whereas the present invention would leave area 55 unfiltered, because it is a dark part of the image. Suzuki also teaches leaving the area between 55 and 56 unfiltered (see column 6, lines 58-63), whereas the present invention would filter the right hand part of this area, since it is a bright part adjacent to a dark part.

Suzuki's system operates contrary to the present invention by first determining the filter operations based on the characteristics of density and chromaticity instead of a luminance characteristic. Second, Suzuki's system does filter dark parts of an image by eliminating dark noise dots which is contrary to the present invention in which it does not filter dark areas.

Thus, Suzuki does not teach or suggest, *inter alia*, a detection unit for detecting bright parts of the image, based on the luminance characteristic of the image, that are adjacent to dark parts of the image, from the image data and a smoothing unit coupled to the detection unit for smoothing the bright parts of the image, detected by the detection unit, that are adjacent to the dark parts of the image by filtering the image data, leaving the dark parts of the image unsmoothed, as recited in claim 1.

Also, Suzuki fails to teach or suggest, *inter alia*, detecting dark parts of the image from the image data, and detecting bright parts of the image based on the luminance characteristic of the image that are adjacent to the dark

parts of the image, from the image data and smoothing the bright parts detected in the step by filtering the image data, leaving the dark parts of the image unsmoothed, as recited in claim 8.

In the rejection of claims 5 and 10, it is asserted in the Office Action that Suzuki teaches detecting dark parts of the image having at most a predetermined width and smoothing only bright parts of the image that are adjacent to these parts. Figs. 6-11 and 23-29 are cited to support this rejection. However, applicants respectfully submit that Figs. 6-11 relate to the first embodiment of Suzuki, which uses the threshold comparison described above to detect areas with greatly changing density. This comparison operation does not detect dark parts having at most a predetermined width. Further, the comparison does not distinguish between dark and bright areas nor does it measure the width of any area. Calibrating the image dimensions by dividing the length of a horizontal scanning line into 100 equal parts (see column 2, lines 9-10), for example, does not constitute measuring the width of a dark part of the image.

Further, figs. 23-25 are directed to the fourth embodiment of Suzuki, in which dark areas are filtered and bright areas are not filtered. This is contrary to the present invention and in fact opposite the methods of the present invention and thus teaches away from the present invention.

Furthermore, figs. 26-29 are directed to the fifth embodiment of Suzuki, in which bright areas are filtered regardless of whether they are adjacent to

dark areas, and dark areas are left unfiltered. This operation also fails to measure the width of the dark areas and instead filters bright areas adjacent to dark areas of any width.

Also, Le fails to make up for the deficiencies of Suzuki. Le teaches the filtering of an entire area of pixels surrounding a detected edge of an image. This area includes both dark and bright image pixels. Le addresses the problem of smoothing jagged edges without blurring the edges, altering image texture, or causing other unwanted effects. In Le's teachings, the roles of bright and dark are reversible. For example, Le at column 3, lines 19-33 and column 29, lines 9-18, proposes to thicken dark oblique lines in areas in which dark features are in the minority, and to thicken bright oblique lines in areas in which bright features are in the minority. Therefore, Le's system treats dark and bright areas differently than the claimed invention. Thus, Le also teaches away from the present invention

In view of the above, the combination of Suzuki and Le fails to teach each and every feature of the claimed invention as required under 35 U.S.C. §103 rejection. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

For at least these reasons, it is respectfully submitted that claims 1-11 and 21-26 are distinguishable over the cited references. Favorable consideration and prompt allowance are earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad J. Billings (Reg. No. 48,917) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By _____
Michael R. Cammarata, #39,491

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

MRC/CJB:cb
1190-0496P

Attachment(s)